



# Maximizing the Effectiveness of Water Quality and Ecosystem Data Collection & Dissemination

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Monitoring Council  
Coordinator

# Everyone Needs Data

- 💧 211,000 miles of rivers & streams
- 💧 1.6 million acres lakes
- 💧 1,100 miles of coastline
- 💧 1.3 million acres of bays and estuaries
- 💧 15 million acre-feet of groundwater extracted per year






# The Water Quality & Ecosystem Information Problem

## 2006 CALIFORNIA 303(d) LIST \* OF WATER QUALITY LIMITED SEGMENTS



\* Includes waters requiring TMDLs, and those being addressed by completed TMDLs or actions other than a TMDL.



-  Regional Board Boundaries
-  2006 303(d) listed bays, estuaries, lakes, and wetlands
-  2006 303(d) listed rivers and shorelines

# The Response – Senate Bill 1070

- 💧 Became California law in 2006
- 💧 Required formation of California Water Quality Monitoring Council
- 💧 Memorandum of Understanding between
  - 💧 California Environmental Protection Agency
  - 💧 California Natural Resources Agency
- 💧 Monitoring Council recommendations
  - 💧 December 2008
  - 💧 Maximize efficiency and effectiveness of existing water quality data collection and dissemination
  - 💧 Ensure collected data available to decision makers and public
- 💧 Comprehensive Monitoring Program Strategy for CA
  - 💧 December 2010

# Monitoring Council Members



**Citizen Monitoring  
(current vacancy)**



**CALIFORNIA STORMWATER  
QUALITY ASSOCIATION**



**Association  
of California  
Water Agencies**  
Since 1910  
Leadership  
Advocacy  
Information

# Monitoring Council Strategy

- 💧 Focus on streamlined data access
  - 💧 Theme-based web portals
  - 💧 Directly address users' questions
  - 💧 Single global point of entry
- 💧 Theme-specific workgroups
  - 💧 Develop web portals
  - 💧 Review and coordinate monitoring programs
- 💧 Overarching Monitoring Council guidance





# Website and Portals

[www.MyWaterQuality.ca.gov](http://www.MyWaterQuality.ca.gov)

## CALIFORNIA WATER QUALITY MONITORING COUNCIL

[Home](#) [Safe to Drink](#) [Safe to Swim](#) [Safe to Eat Fish](#) [Ecosystem Health](#) [Stressors & Processes](#) [Contact Us](#)

My Water Quality | Monitoring Council | This site is hosted by the Surface Water Ambient Monitoring Program (SWAMP) |

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  - About SWAMP
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## Welcome to My Water Quality

This web portal, supported by a wide variety of public and private organizations, presents California water quality monitoring data and assessment information that may be viewed across space and time. Initial web portal development concentrates on four theme areas, with web portals to be released one at a time. Click the [Contact Us](#) tab for more information.

The Monitoring Council seeks to provide multiple perspectives on water quality information and to highlight existing data gaps and inconsistencies in data collection and interpretation, thereby identifying areas for needed improvement in order to better address the public's questions. Questions and comments should be addressed through the [Contact Us](#) tab.



### IS OUR WATER SAFE TO DRINK?

Safe drinking water depends on a variety of chemical and biological factors regulated by a number of local, state, and federal agencies. [\[Future Portal\]](#)



### IS IT SAFE TO SWIM IN OUR WATERS?

Swimming safety of our waters is linked to the levels of pathogens that have the potential to cause disease. [More >>](#)



### IS IT SAFE TO EAT FISH AND SHELLFISH FROM OUR WATERS?

Aquatic organisms are able to accumulate certain pollutants from the water in which they live, sometimes reaching levels that could harm consumers. [More>>](#)



### ARE OUR AQUATIC ECOSYSTEMS HEALTHY?

The health of fish and other aquatic organisms and communities depends on the chemical, physical, and biological quality of the waters in which they live. [More>>](#)



- Cal/EPA
- Natural Resources Agency
- About the California Water Quality Monitoring Council

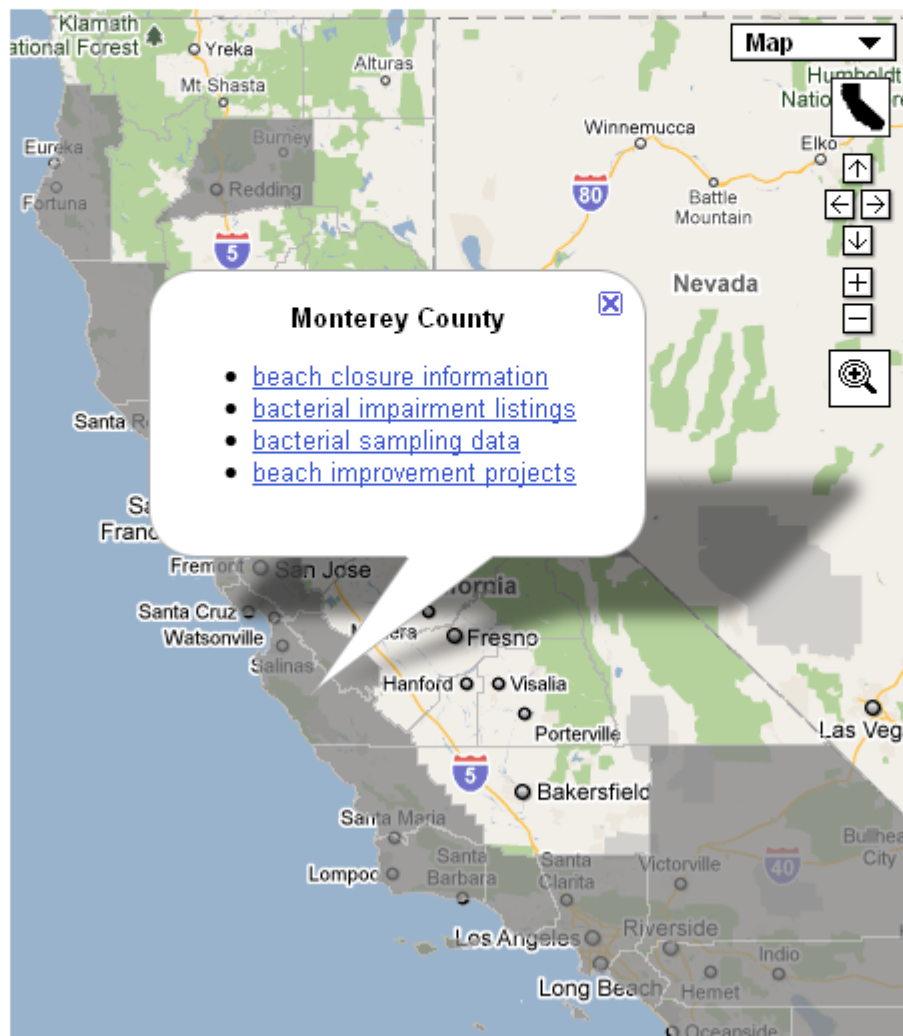
### SAFE TO SWIM LINKS

- Pollution Sources & Health Risks
- Laws, Regulations & Standards
- Regulatory Activities
- Enforcement Actions
- Research
- Monitoring Programs, Data Sources & Reports

Home → Safe To Swim

## Is It Safe to Swim In Our Waters?

Show County Info:



Beach water quality monitoring and strong pollution prevention measures are critical for protecting beach goers from waterborne diseases. Monitoring is performed by city and county health agencies, publicly owned sewage treatment plants, other dischargers, environmental groups and numerous citizen-monitoring groups.

### View Monitoring and Assessment Information

- Click on a county or;
- Select from the Show County Info menu.

### QUESTIONS ANSWERED

- [Can I swim at my beach, lake, or stream?](#)
- [How clean was my beach, lake, or stream during the past week or month?](#)
- [What are the long-term trends at my beach, lake, or stream?](#)
- [Which beaches, lakes, and streams are currently closed by county health agencies?](#)
- [Which beaches, lakes, and streams are listed by the State as impaired?](#)
- [Are the problems getting better?](#)



 [RSS](#)  [Print](#)  [Email](#)  [Link](#)

### Historical Data

Documents

## FAQ

[\[West Coast\]](#) [\[State View\]](#)Grade Type: ☒ Dry ☐ Wet [?]

Grade Type: ☒ Dry ☐ Wet

Los Angeles County

Search Beach

Go

### Predefined Searches

## Los Angeles County

North to South

Los Angeles County  
A+ dry, A+ wet

4 Will Rogers State  
Beach at 17200 PCH  
(1/4 mile east of  
Sunset drain)

Los Angeles County  
A+ dry, F wet

### 5 Tuna Canyon

Los Angeles County  
**D** dry, ns wet

6 Encinal Canyon at El Matador State Beach

Los Angeles County  
A+ dry, A+ wet

7 Marie Canyon storm drain at Puerco Beach, at 24572 Malibu Rd.

Los Angeles County

Beaches Key:

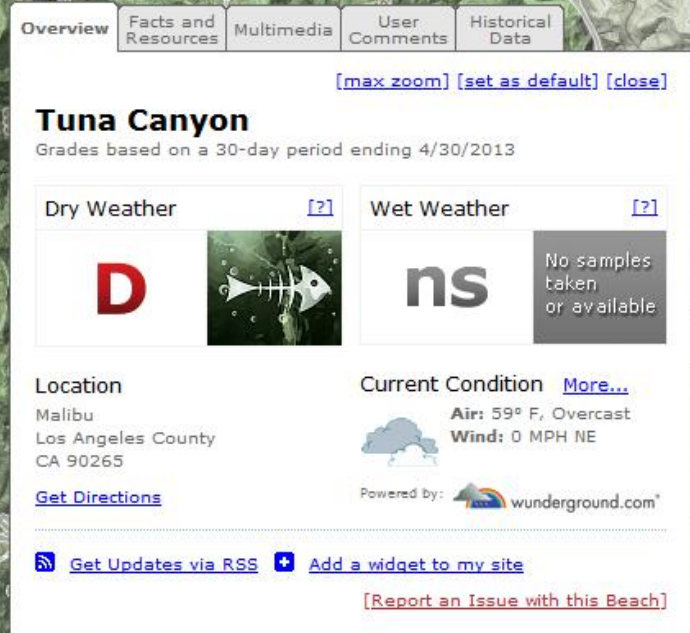
● A or B Grade

 C Grade

 D or F Grade

 Beach Closed

● ns - no sample [?]



## State Alerts

 0 Closures

 [0 Rain Advisories](#)[Learn More](#)

## State Summary

Heal the Bay analyzed data for [460 locations](#) in California this grading period. Grades updated on Fridays.

## What's New

5/23/2013  
2012-2013 Annual Beach  
Report Card

## Be Safe at the Beach

### Tips for Clean Beaches

## Volunteer

## Take Action

[Donate](#)

## Connect

[Follow BRC On Twitter](#)

## What are the Long-Term Bacteria Trends at My Beach, Lake, or Stream?

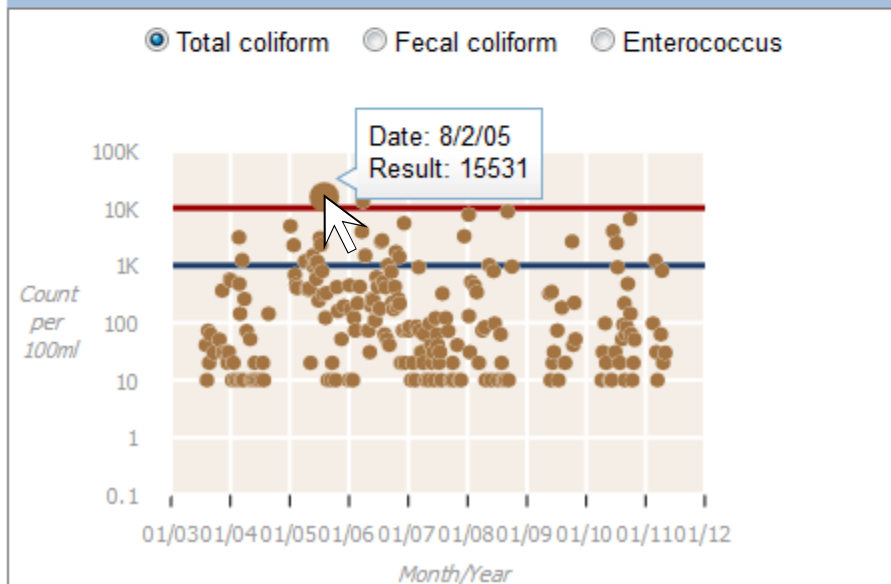


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Santa Barbara ☐ Show county



Understanding trends allows decision makers to determine whether pollution sources are increasing in magnitude and/or frequency and the effectiveness of control measures.

### View Trends in Bacterial Indicator Levels

The interactive map below provides sampling results for coastal beach monitoring locations over time. A few county health agencies provide creek and lake information along with ocean beach information. Otherwise, lake and stream information is currently unavailable electronically.

- To find bacterial sample results for a particular site, first select the county, then click on a site location. The results will appear to the right of the map. **Results may take time to appear.**
- Place your mouse cursor over a point on the chart to see the date and sample result for a particular sample event.

Horizontal lines on the charts represent bacterial water quality objectives specified in the [2009 California Ocean Plan](#).

- **Red** is the Single Sample Maximum objective. Sample points above this line represent violations of the objective.
- **Blue** is the 30-day Geometric Mean objective - the geometric mean of the five most recent samples from each

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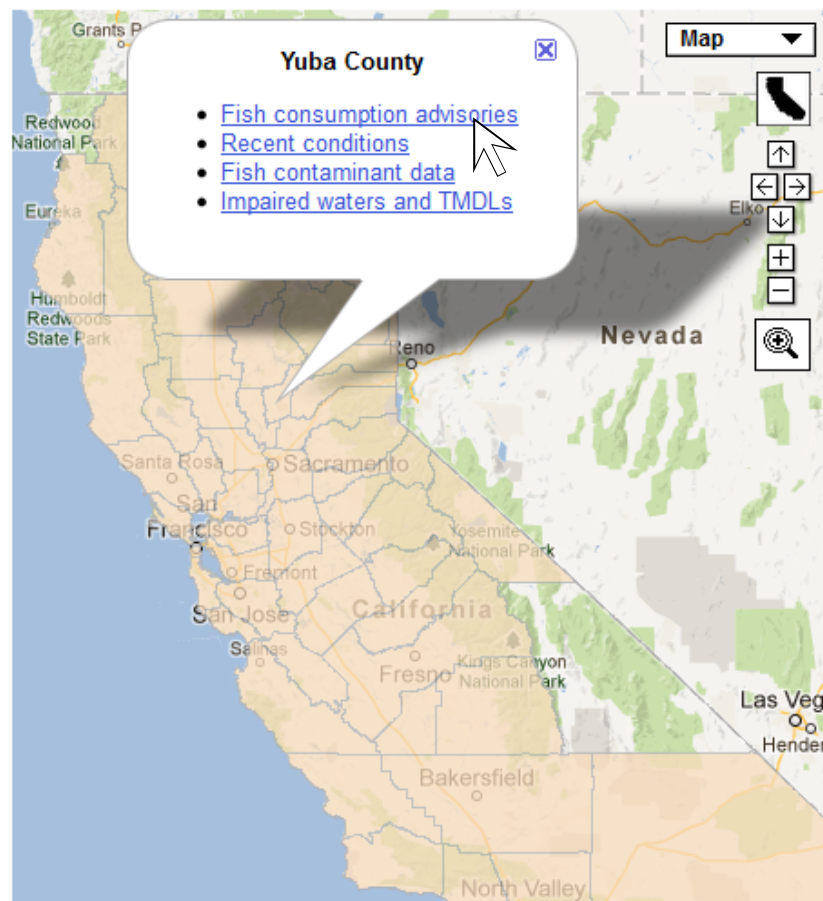
### ARE OUR AQUATIC ECOSYSTEMS HEALTHY?

The health of fish and other aquatic organisms and communities depends on the chemical, physical, and biological quality of the waters in which they live. [More>>](#)



## Is It Safe to Eat Fish and Shellfish From Our Waters?

Show County Info:  ☒ Show counties



Fish and shellfish are nutritious and good for you to eat. But some fish and shellfish may take in toxic chemicals from the water they live in and the food they eat. Some of these chemicals build up in the fish and shellfish - and in the humans that eat fish and shellfish - over time. Although the chemical levels are usually low, it is a good idea to learn about advisories and monitoring in water bodies where you fish, and for fish or shellfish you eat.

### QUESTIONS ANSWERED

- » [Can I eat fish or shellfish caught in my lake, stream, or ocean?](#)
- » [Does my lake, stream, or ocean location have fish or shellfish with contaminants at levels of concern?](#)
- » [What are the levels and long-term trends in my lake, stream, or ocean location?](#)
- » [Which lakes, streams, or ocean locations are listed by the State as impaired?](#)
- » [What is being done to reduce these problems?](#)

Water Quality information addressing these questions is currently available for the counties that are shaded on this map. This portal is a work in progress, initially showing readily available data and assessment information. More will be added as it becomes available.

- » Click on a question to view water quality information specific to that topic.
- » Click on a county or select the county from the

Home » Safe To Eat » Consumption Advisories

## Can I Eat Fish or Shellfish Caught in My Lake, Stream, or Ocean Location?



County:  Water Body:   
☒ Show county

### Fish and Shellfish Consumption Advisories by Location

There are health benefits from eating fish and shellfish. But, some fish and shellfish may contain chemical or biotoxin contaminants that could pose health risks. When contaminant levels are unsafe, consumption advisories may recommend that people limit or avoid eating certain species of fish caught in certain places and at certain times.

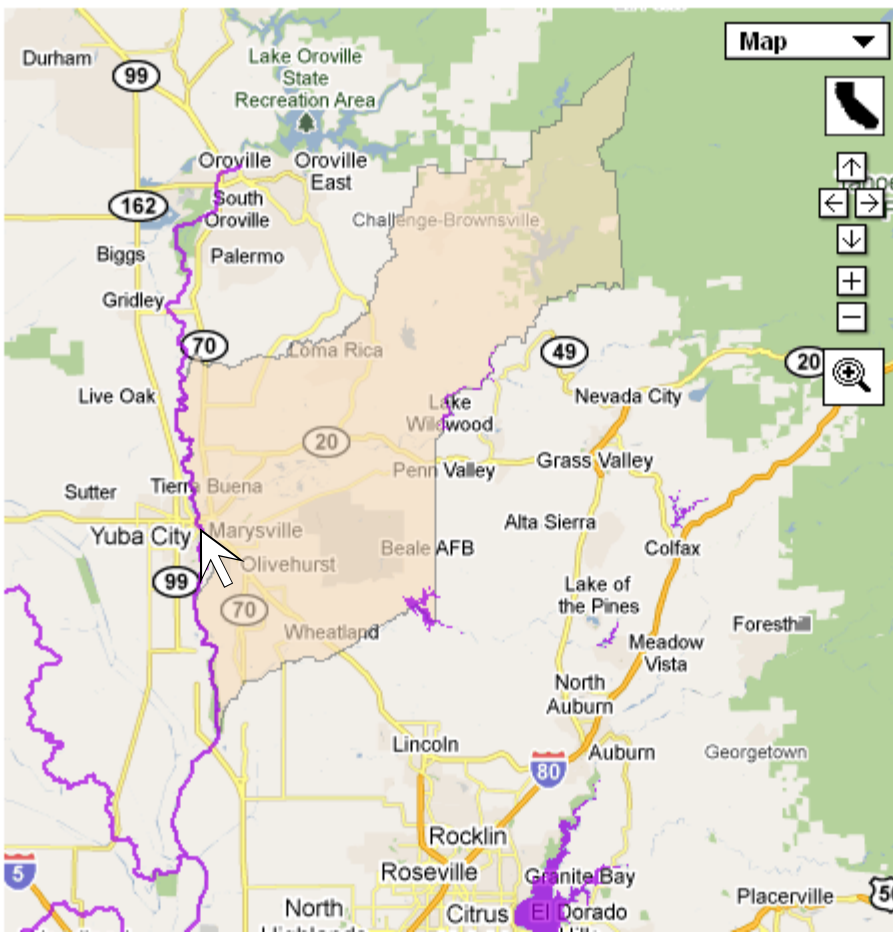
#### [California Sport Fish Consumption Advisories](#)

For a number of California water bodies, the Cal/EPA office of Environmental Health Hazard Assessment (OEHHHA) publishes consumption advisories for chemicals in noncommercial fish which you and your family or friends catch.

**These advisories are shown on the map to the left.**



- Click on a water body (shown in **purple**), or
- Select (or type) the county in the County box, then select the water body from the Water Body menu, or
- Select (or type) the water body name directly in the Water Body box



### SAFE TO EAT FISH LINKS

- [Pollution Sources & Health Risks](#)
- [Laws, Regulations, Standards & Guidelines](#)
- [Assessment Thresholds](#)
- [Regulatory Activities](#)
- [Enforcement Actions](#)
- [Research](#)
- [Monitoring Programs, Data Sources & Reports](#)
- [Statewide Perspective](#)
- [National Perspective](#)



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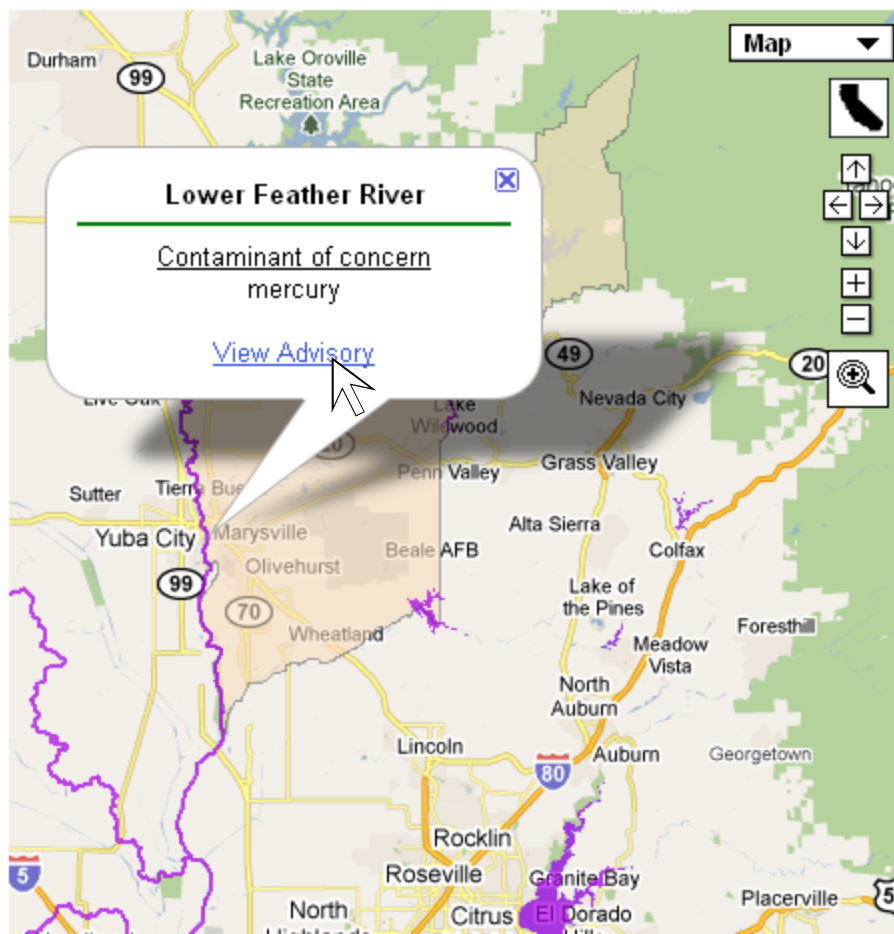
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## FISH

### MOST POPULAR LINKS

- [Art and Crafts Hazards List](#)
- [Cal/Ecotox Database](#)
- [Decisions Pending and Opportunities for Public Participation](#)
- [Hot Spots](#)
- [Press Releases](#)
- [Proposition 65 List of Chemicals](#)
- [Public Health Goals](#)
- [Public Records Act Requests](#)
- [Soil Screening Values](#)
- [Toxicity Criteria Database](#)

### LISTSERVS

- [OEHHA Listserv](#)
- [Biomonitoring Listserv](#)
- [Fish Listserv](#)
- [Northern California Spill Alert](#)
- [Prop. 65 Listserv](#)
- [Southern California Spill Alerts](#)










### CONTACT OEHHA

- [Help!](#)
- [Contact OEHHA Staff](#)

## SAFE EATING GUIDELINES FOR FISH FROM THE LOWER FEATHER RIVER (BUTTE, YUBA AND SUTTER COUNTIES) [08/11/06, UPDATED 03/18/09]

### Safe Eating Guidelines for the Lower Feather River

Women 18 – 45 and Children 1 – 17 Years

 <p>American Shad </p>	 <p>Carp</p>  <p>Sucker</p>  <p>Redear or other sunfish</p>	 <p>Black Bass</p>  <p>Catfish</p>  <p>Pikeminnow</p>  <p>Striped Bass</p>
4 Servings a week	1 Serving a week	Do not eat

- [Safe Eating Guidelines](#)
- [Women & Children](#)
- [Alternate Languages](#)
  - [Pescado](#)
- [Chemicals in Fish](#)
  - [Mercury](#)
  - [PCBs](#)
- [Advisory Map](#)
- [Reports](#)
  - [Angler Survey](#)
  - [Fish Consumption](#)
  - [Advisory Tissue Levels](#)
- [Oil Spill Information](#)
- [Links](#)

### EXTERNAL FISH RESOURCES

- [USEPA/FDA RECOMMENDATIONS FOR FISH CONSUMPTION](#)
- [DEPARTMENT OF FISH AND GAME SPORT FISH REGULATION BOOKS](#)
- [DEPARTMENT OF PUBLIC HEALTH FISH INFORMATION](#)
- [SACRAMENTO-SAN JOAQUIN DELTA FISH MERCURY PROJECT](#)
- [SOUTHERN](#)



## What are the Levels and Long-Term Trends in My Lake, Stream, or Ocean Location?

- Cal/EPA
- Natural Resources Agency
- About the California Water Quality Monitoring Council

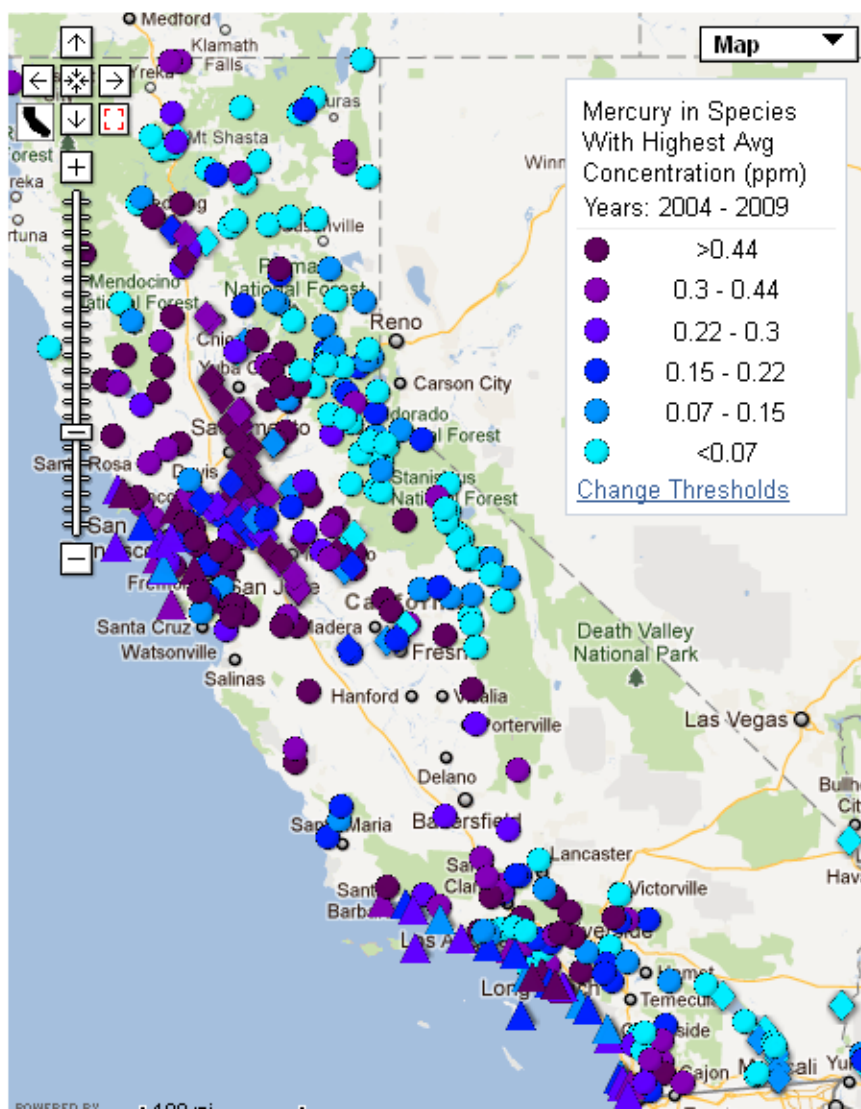
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Select location

Zoom to county:

☐ Show counties



### Contaminant Data

This interactive map allows you to explore fish contaminant data for your fishing locations. Data are available from extensive monitoring by SWAMP of lakes and reservoirs in 2007 and 2008, from the coast in 2009, and from other studies. Data from 2007-2009 are shown by default. [Map Instructions](#)

Select Species:

Species With Highest Avg Concentration

Select Contaminant:

Mercury

Select Start Date:

Select End Date:

2004

2009

Go

Reset

[Download Map Data](#)

### More Information

- [Monitoring programs and reports](#)
- [Access Complete Datasets from CEDEN](#)
- [Assessment thresholds](#)

This map shows data generated by:





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Select location  Zoom to county: Butte

### Contaminant Data

This interactive map allows you to explore fish

☐ Show co

### Lake Oroville

[View Safe Eating Guidelines for this water body.](#)

Data

Trends

Nearby Locations

### What are the most recent data for my location?

#### Contaminant Data For 2004 - 2009

Species	MERCURY (ppm)	Sample Year	Prep Code	Sample Type
Common Carp	0.26	2007	Skin off	Average of Location Composites
Smallmouth Bass	0.44	2007	Skin off	Average of Individuals

A result of ND means the concentration was below detection limits.

Mercury in Species  
With Highest Avg  
Concentration (ppm)  
Years: 2004 - 2009

- >0.44
- 0.3 - 0.44
- 0.22 - 0.3
- 0.15 - 0.22
- 0.07 - 0.15
- <0.07

[Change Thresholds](#)



### More Information

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## Which Lakes, Streams, or Ocean Locations Are Listed By The State As Impaired?

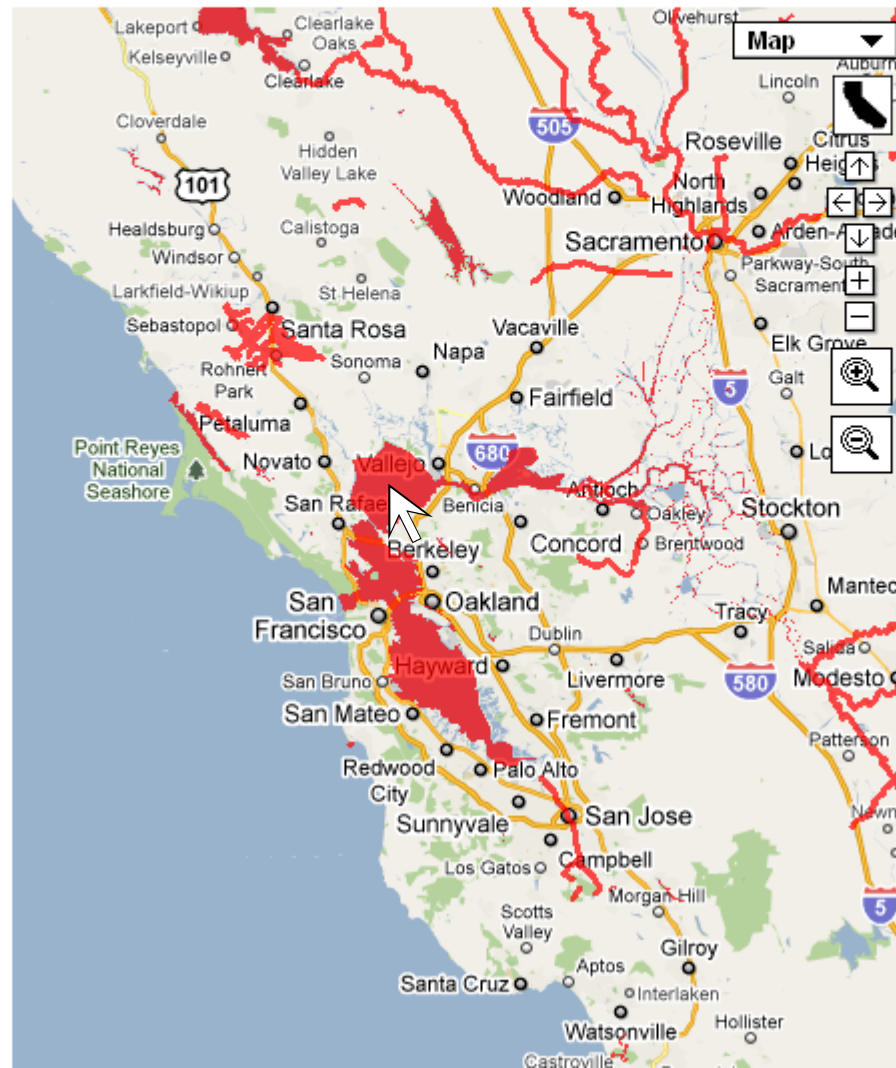
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County:  Water Body:

☐ Show county



This interactive map shows which of California's waters are listed as impaired for uses related to fish or shellfish consumption by humans and which pollutants are involved. Also shown are the Total Maximum Daily Load (TMDL) projects to reduce pollutants to acceptable levels.

### View 2006 303(d) Listing and current TMDL Information:

- Click on a water body (shown in **red**), or
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- Use the magnifier tool to zoom into an area of interest (more highlighted water bodies will appear)
- Click on the state outline tool to return to a statewide view

### Impaired Water Bodies

Listing a water body as impaired in California is governed by the [State Water Board's 303\(d\) Listing Policy](#).



The State and Regional Water Boards assess water quality data for California's waters every two years to determine if they contain pollutants at levels that exceed protective water quality criteria and standards. This biennial assessment is required under Section 303(d) of the [federal Clean Water Act](#).



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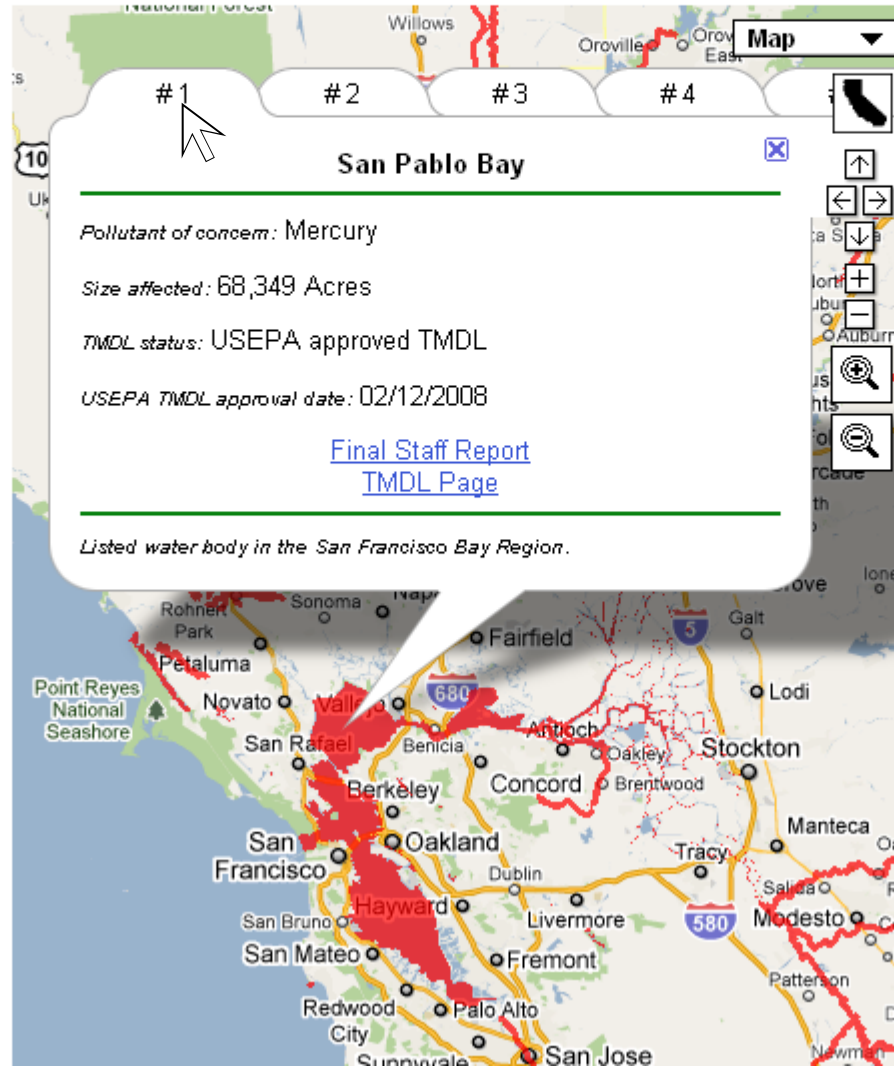
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## AQUATIC HEALTH LINKS

- Stressors
- Laws, Regulations & Standards
- Regulatory Activities
- Enforcement Actions
- Research
- Monitoring Programs, Data Sources & Reports

[Home](#) → [Eco Health](#)

## Are Our Aquatic Ecosystems Healthy?



California has many types of aquatic habitats. Follow the links below to learn more ...



### WETLANDS

Wetlands form along the shallow margins of deepwater ecosystems such as lakes, estuaries, and rivers. They also form in upland settings where groundwater or runoff makes the ground too wet for upland vegetation. [More »»](#)



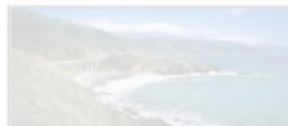
### ESTUARIES

Estuaries are unique habitats found where rivers and the ocean mix. They feature a diverse array of plants and animals adapted to life along the mixing zone. [\[Future Portal\]](#)



### STREAMS, RIVERS & LAKES

California's streams and rivers flow through diverse habitats, from mountain canyons, valleys, deserts, estuaries and urban areas. Riparian woodlands develop along stream banks and floodplains, linking forest, chaparral, scrubland, grassland, and wetlands. California lakes, supporting deep water, wetlands, riparian woodlands, offer a quiet refuge for plants, animals and humans alike. [More »»](#)



### OCEAN

California has 1,100 miles of shoreline and 220,000 square miles of state and federal oceanic habitat, featuring one of the world's most diverse marine ecosystems. [\[Future Portal\]](#)



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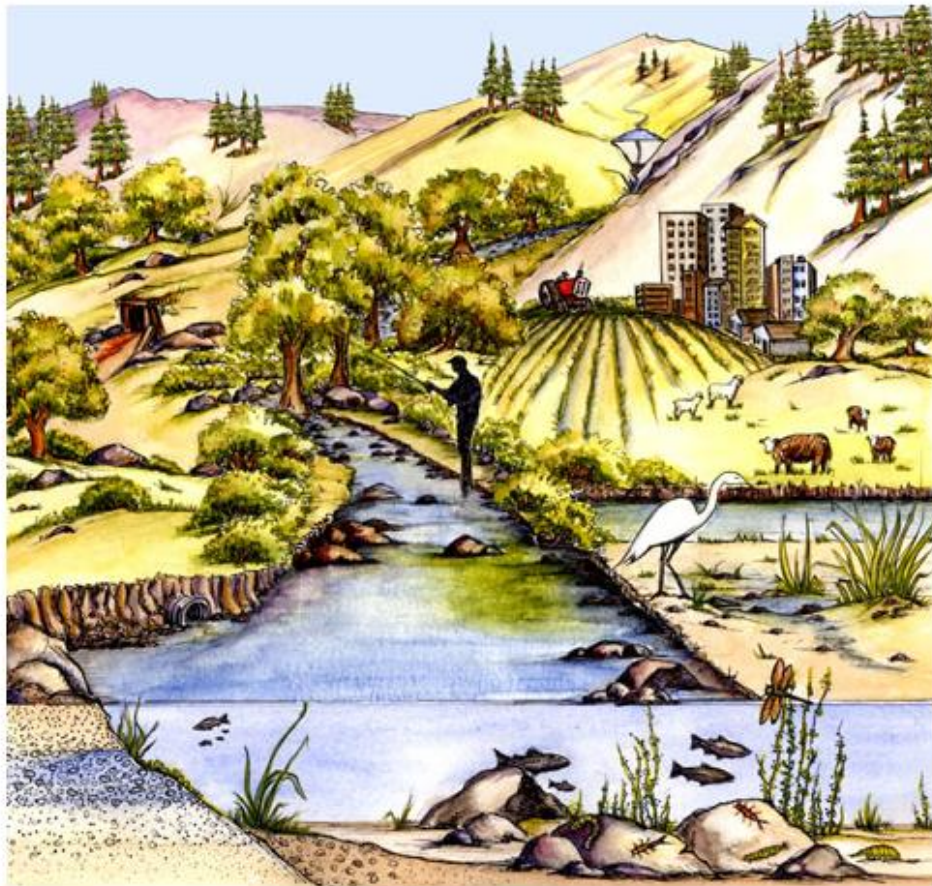
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## California Streams, Rivers and Lakes

[Urban](#) | [Agriculture](#) | [Other Uses](#) | [Fines & Sands](#) | [Gravels](#) | [Cobbles & Boulders](#) | [Riffles & Rapids](#) | [Buffer](#) | [Riparian Cover](#) | [Pools](#) | [Groundwater](#) | [Water Quality](#) | [Sediment Quality](#) | [Stream Gradient](#) | [Channel Stability](#) | [Channel Alteration](#) | [Algae](#) | [Bugs](#) | [Fish](#) | [Fish Contaminants](#) |

**Also see:** [Hydrologic Connectivity](#) | [Hydrologic Sufficiency](#) | [Invasive Species](#) | [Sediment Balance](#)



Healthy streams, rivers, and lakes provide safe drinking water, recreational opportunities, and important habitat for species ranging from the red-shouldered hawk to steelhead to crayfish and dragonflies. Maintaining healthy streams, rivers, and lakes can reduce the need for water treatment and water supply costs and make landscapes more resilient to climate change. To determine the health of a waterway and the flora and fauna that live there, investigators can use a combination of chemical, biological, and physical assessments. Among the characteristics that may be considered are habitat quality, aquatic life diversity, water chemistry, stream hydrology, the physical channel form, and sediment transport processes of the stream.

*Navigation Instructions:* [Show](#) | [Hide](#)

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### QUESTIONS ANSWERED

- [What is the extent of our stream and river resources?](#)
- [What is the condition of our streams and rivers?](#)
- [What is being done to make our waters healthier?](#)

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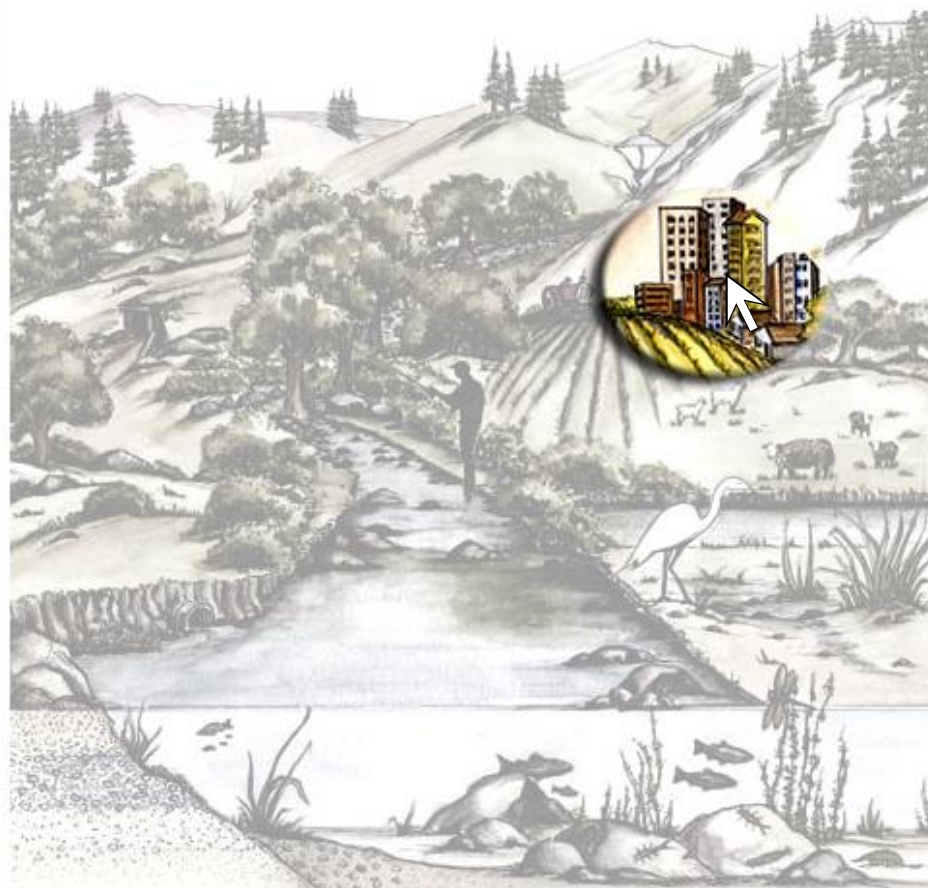
## AQUATIC HEALTH LINKS

- Stressors
- Laws, Regulations & Standards
- Regulatory Activities
- Enforcement Actions
- Research
- Monitoring Programs, Data Sources & Reports

## California Streams, Rivers and Lakes

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## QUESTIONS ANSWERED

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→ [California Watersheds Slideshow](#) - Learn



## California Streams, Rivers and Lakes

### Why is Land Use Important?

#### → Nearby Urban

The developed landscapes found in urban areas introduce a number of factors that can affect the health of nearby streams, rivers, and lakes. Roads and other paved surfaces, sewer systems, gardens and parks, industrial facilities, and storm water management systems mark the landscape. These cause significant changes in how water flows across the landscape and on the content of that water. Stormwater runoff in urban areas can pick up sediment, oils and chemical residue from our cars and streets; bacteria and nutrients from pet waste; and pesticides and nutrients from lawns and gardens. These pollutants can harm fish and wildlife populations, compromise native vegetation, and degrade water quality.



Buildings, paved parking lots and roads are hard, impervious surfaces which control how water is transported to urban streams. In an urban setting, rain and snowmelt cannot penetrate the hard surfaces and soak into the [ground](#). Instead, stormwater drains directly to storm drains, streams, or other surface water bodies. Typically the volume and velocity of surface water are higher in urban areas than in undeveloped areas. This can [alter the natural drainage patterns](#) and change the physical habitat of streams.

Often streams that flow through our cities and towns have lost many of the adjacent trees and shrubs that provide shade and streamside (riparian) habitat. The loss of riparian vegetation may increase water temperature above that which is healthy for fish and other native species that live in the streams.

#### → Nearby Agriculture

Agricultural practices can greatly impact stream health. Plowing, pesticide application, irrigation, fertilizing, planting, and harvesting can introduce [pollutants](#) into nearby streams. Confined animal facilities (e.g., feedlots, dairies), and grazing can also be a source of pollution. Excess sediment, nutrients, pathogens, pesticides, and salts are commonly found pollutants in waters adjacent to and downstream of agricultural areas.



Grazing cattle can eliminate [riparian vegetation](#), trample stream bank and bottom habitat, and compact the soil, making it harder for rainfall to infiltrate soils and move into [groundwater](#) basins. Instead, more water flows directly into streams. Some natural drainages are channelized to provide water for irrigation or to move agricultural runoff away from fields. Increased flow volume and velocity can [alter the natural drainage patterns](#) and change the physical habitat of streams.

#### → Other Uses

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- About the California Water Quality Monitoring Council

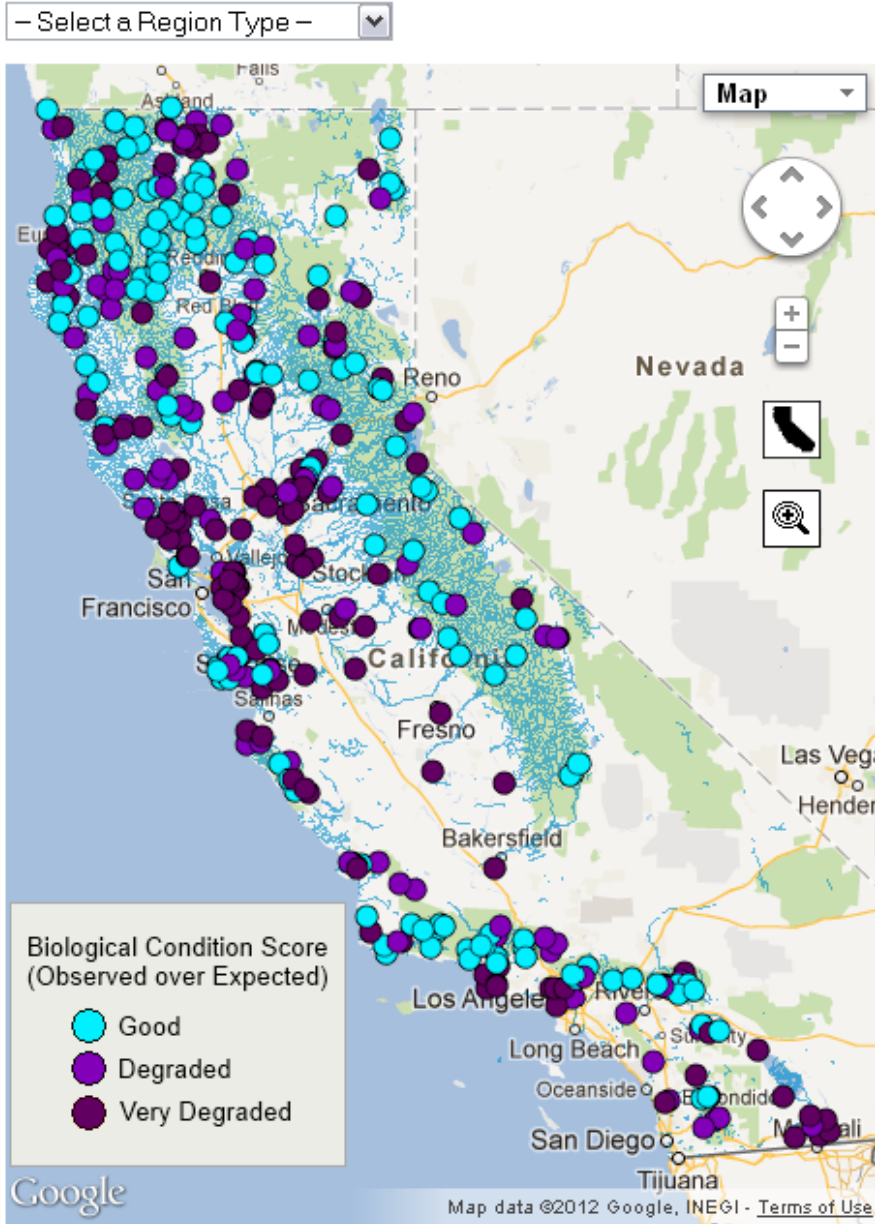
### AQUATIC HEALTH LINKS

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### AQUATIC HEALTH LINKS

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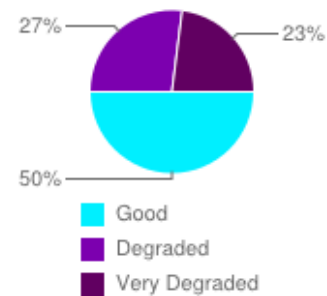
### What do Benthic Macroinvertebrates tell us about the health of our streams?

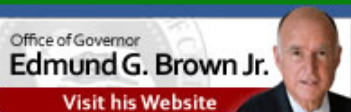
One powerful way to measure stream health is through an assessment of the bugs, or benthic macroinvertebrates, that live there. Benthic macroinvertebrates, which live on the bottom of streams, include early life stages of insects such as dragonflies and mayflies, crustaceans such as crayfish, and worms and snails. The particular species and abundance of invertebrates present in a stream can help scientists determine both the current condition of a stream and the cumulative impact of longer term stressors, such as pollution. For example, a stream with a variety of species that includes sensitive species is considered healthier than one with a few pollution-tolerant species.

Bioassessment is the characterization of environmental conditions through the observation of biological communities of organisms. Two common types of bioassessment are O/E and IBI. O/E stands for observed over expected, which compares the number of certain species observed at a site to the number of those species that were expected to occur, based on data from reference sites that are known to be healthy. IBI is an Index of Biotic Integrity, which combines a variety of individual measures of health of a community of organisms, such as species richness (how diverse the community is) and pollution tolerance (how resistant to pollution they are).

→ [View reports of the State Water Board's Perennial Streams Assessment \(PSA\)](#)

### Statewide Statistics

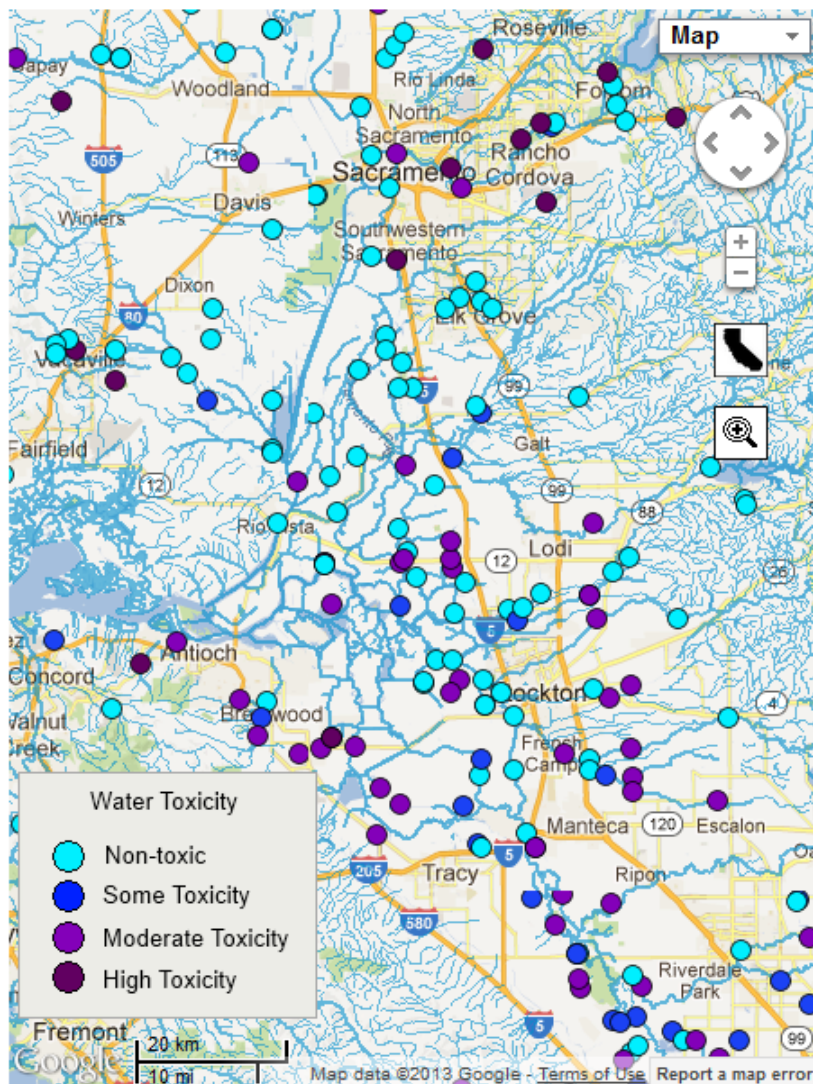




Home » Eco Health » Streams » Condition

## California Streams, Rivers and Lakes

-- Select a Region Type --

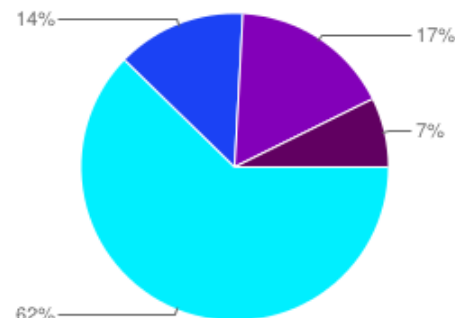


### How toxic is the water in our streams, rivers and lakes?

To measure how well a water body supports aquatic life, we can perform a toxicity test. Water samples from a given water body are taken to the laboratory and test organisms are exposed to that water to see if they exhibit any adverse effects. Toxicity tests are especially useful in water quality monitoring because they show the overall effect on aquatic life of all of the chemicals found in the water sample. Toxicity tests can assess mortality, behavioral changes, reproductive status or physiological and biochemical changes. Follow-up tests called Toxicity Identification Evaluations are used in the laboratory to identify the probable cause of toxicity. In California, pesticides have been a common cause.

The assessment of toxicity displayed here is based on methods used to summarize nine years of toxicity testing data collected by the Surface Water Ambient Monitoring Program (SWAMP) and partner programs ([click here to view the report](#)). The process used to characterize the magnitude of toxicity at each site was designed to integrate results from multiple samples taken at a site and multiple tests conducted on the samples. Note that the assessment displayed here does not completely match the [SWAMP report](#) due to differences in statistical methods and additional data assessed in this portal.

### Statewide Statistics



## CALIFORNIA WATER QUALITY MONITORING COUNCIL

[Home](#) [Safe to Drink](#) [Safe to Swim](#) [Safe to Eat Fish](#) [Ecosystem Health](#) [Stressors & Processes](#) [Contact Us](#)

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## AQUATIC HEALTH LINKS

→ Stressors  
→ Laws, Regulations &  
Standards  
→ Regulatory Activities  
→ Enforcement Actions  
→ Research  
→ Monitoring Programs,  
Data Sources & Reports

[Home](#) → [Eco Health](#)

## Are Our Aquatic Ecosystems Healthy?

California has many types of aquatic habitats. Follow the links below to learn more ...



### WETLANDS

Wetlands form along the shallow margins of deepwater ecosystems such as lakes, estuaries, and rivers. They also form in upland settings where groundwater or runoff makes the ground too wet for upland vegetation. [More »»](#)



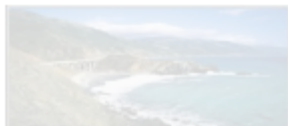
### ESTUARIES

Estuaries are unique habitats found where rivers and the ocean mix. They feature a diverse array of plants and animals adapted to life along the mixing zone. [\[Future Portal\]](#)



### STREAMS, RIVERS & LAKES

California's streams and rivers flow through diverse habitats, from mountain canyons, valleys, deserts, estuaries and urban areas. Riparian woodlands develop along stream banks and floodplains, linking forest, chaparral, scrubland, grassland, and wetlands. California lakes, supporting deep water, wetlands, riparian woodlands, offer a quiet refuge for plants, animals and humans alike. [More »»](#)



### OCEAN

California has 1,100 miles of shoreline and 220,000 square miles of state and federal oceanic habitat, featuring one of the world's most diverse marine ecosystems. [\[Future Portal\]](#)

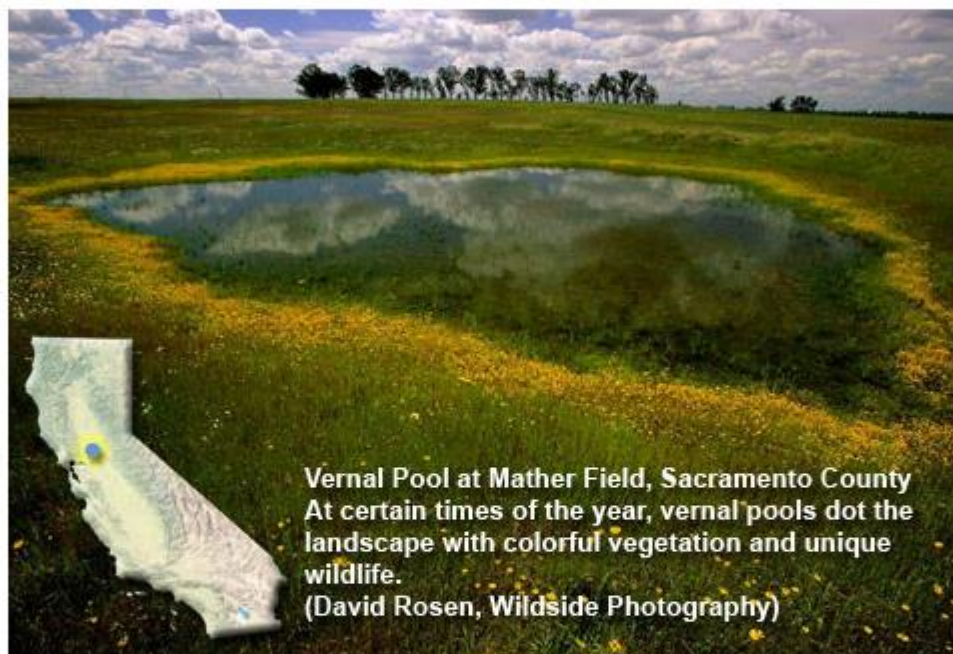


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## WETLANDS

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## California Wetlands



**Vernal Pool at Mather Field, Sacramento County**  
At certain times of the year, vernal pools dot the landscape with colorful vegetation and unique wildlife.  
(David Rosen, Wildside Photography)

Click on an image above for more information



1/9



Wetlands have both aquatic and terrestrial characteristics. Wetlands form along the shallow margins of lakes, estuaries, and rivers, and in areas with high groundwater or shallow surface water, such as springs, wet meadows, ponds, and freshwater and tidal marshes. They often go through wet and dry cycles, and therefore support a unique array of life specially adapted to these conditions. Wetlands provide important habitat for birds, fish, and other wildlife. They support local food webs, contribute to flood protection, groundwater recharge, shoreline protection, and water filtration: all important [ecosystem services](#).

California has lost more than 90% of its [historical wetlands](#) and today, many remaining wetlands are threatened. Wetlands continue to be drained for agriculture,

## QUESTIONS ANSWERED

### What is the extent of our wetlands?

- [Where did our numbers come from?](#)
- [Where are they?](#)
- [How much have we lost?](#)
- [What types are there?](#)
- [How do we classify them?](#)
- [What services do they provide?](#)
- [What is the status of mapping?](#)

### How healthy are our wetlands?

- [How do we know how they're doing?](#)
- [How do we assess wetland health?](#)
- [What studies have documented wetland condition?](#)

### How are our wetlands protected?

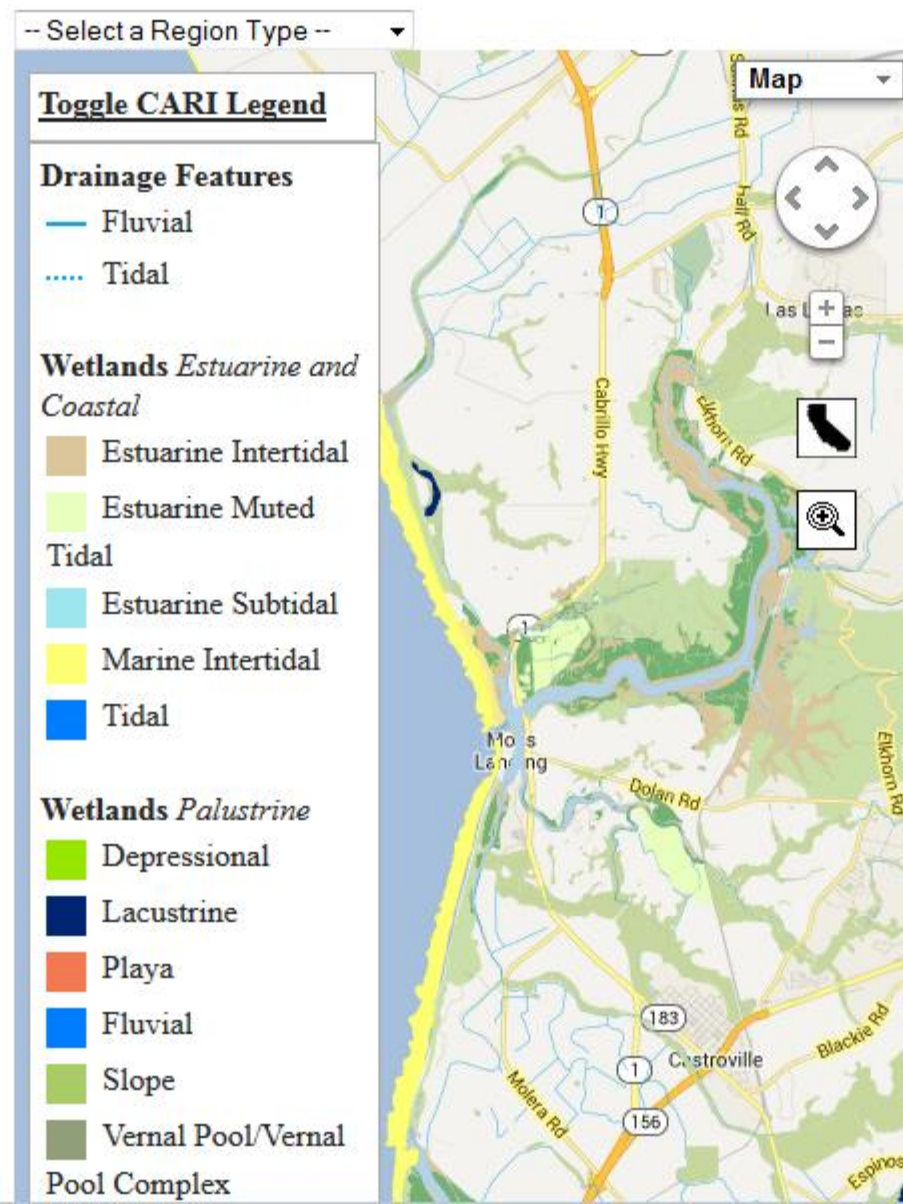
- [What regulations protect them?](#)
- [Where are wetlands being restored near me?](#)

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## WETLANDS

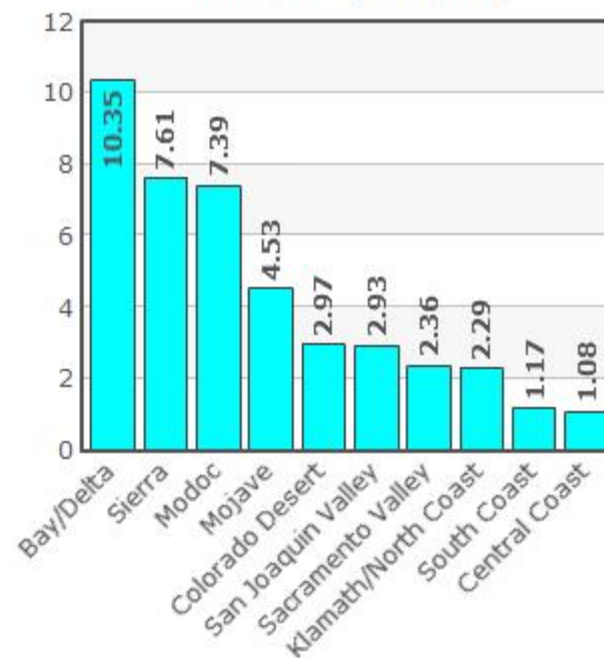
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## Where Are California Wetlands?



Wetlands occur in every region of California, from the high Sierras to the deserts of the southwest, and form wherever water collects. They can vary from location to location be found along streams ([riverine](#)), in low points with slow drainage ([depressional](#)), at the edges of tidal water bodies ([estuarine](#)), at the edges of lakes ([lacustrine](#)), and around springs ([slope](#)).

**California Wetland Acreage by Ecoregion\* (x100,000)**



\* Note this chart does not include non-wetland open water types as listed in CARCS



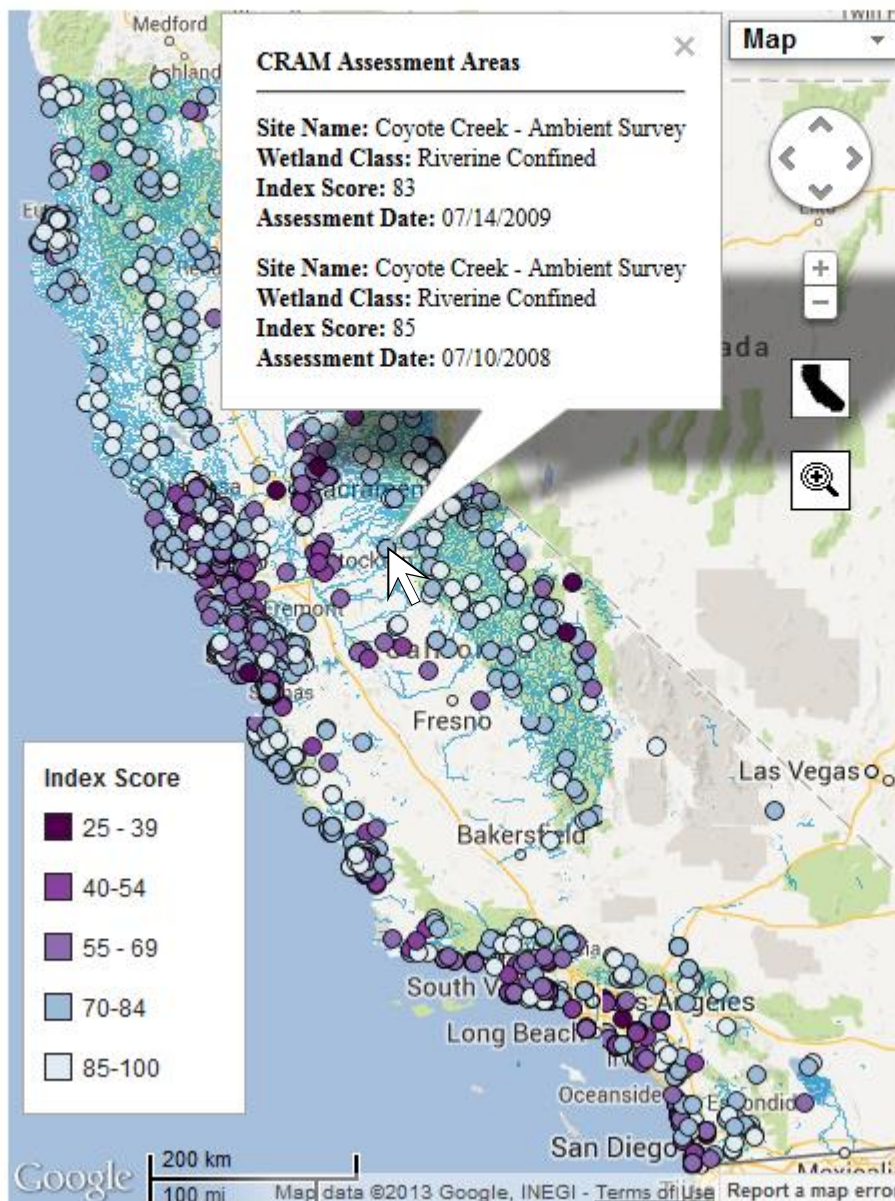
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## WETLANDS

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## How Do We Assess Wetland Health?

-- Select a Region Type --



Measurement of overall health of wetlands has long been an elusive goal for scientists and wetland managers. Methods of analysis were often restricted to individual agencies or organizations for limited purposes. The ability to compare conditions between places and programs was missing, and so we could not measure or understand trends at the watershed, regional and state level.

Today, we are moving to overcome this by standardization of wetland assessments. One way to measure the overall health of streams in California is to perform assessments using the [California Rapid Assessment Method](#) (CRAM). CRAM is a field-based diagnostic tool that, when used as directed, provides rapid, repeatable, and numeric assessment of the overall condition of a wetland.

CRAM assesses four overarching attributes of wetland condition: Buffer and



Landscape Context, Hydrologic Regime, Physical Structure, and Biotic Structure. Each attribute is related to several attribute-specific metrics and submetrics that are evaluated in the field for a prescribed assessment area. The attribute scores are averaged to produce an overall index score. Attribute and index scores range from 25 (lowest possible) to a maximum of 100. In the context of CRAM, condition is evaluated based on observations made at the time of the assessment. Higher scores represent better condition and suggest a higher potential to provide the functions and

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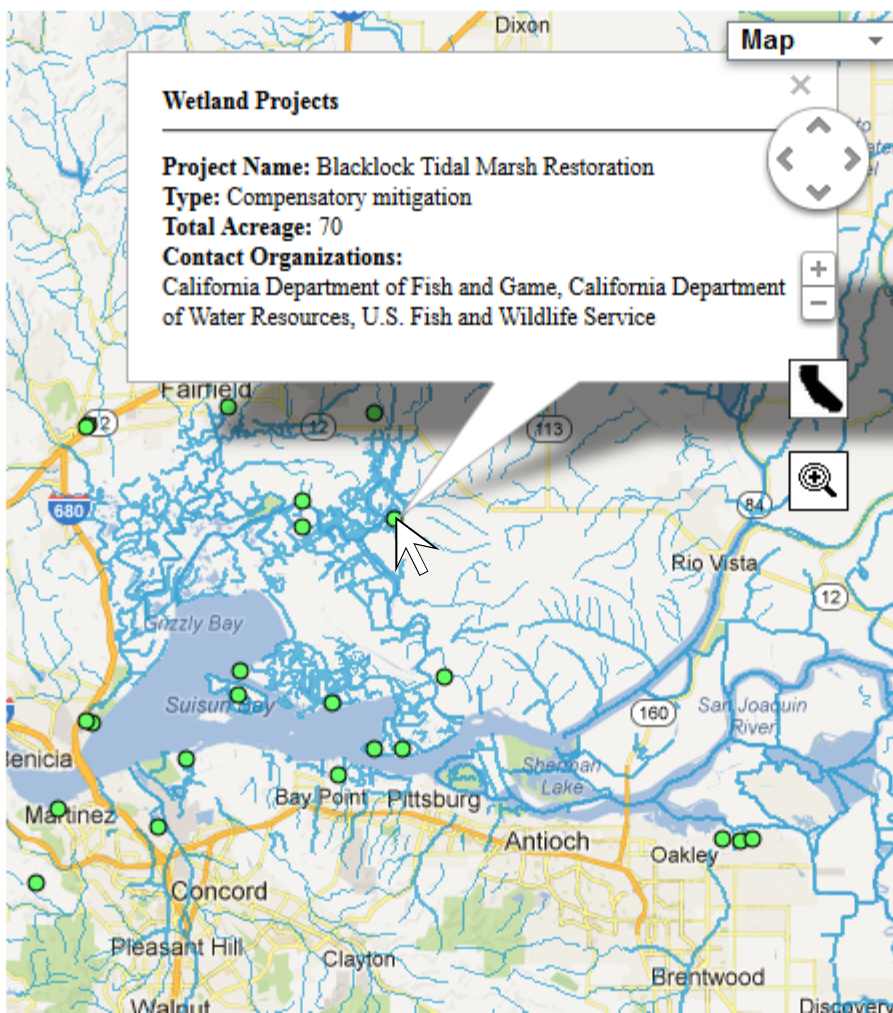
## WETLANDS

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[Home](#) → [Eco Health](#) → [Wetlands](#) → [Improvements](#)

## Where are Wetlands Being Restored Near Me?

-- Select a Region Type --



### Restoration

California has made substantial progress over the last ten years in identifying, acquiring, restoring and enhancing thousands of acres of wetlands. From large scale restoration such as the South Bay Salt Pond Restoration Project to tiny vernal pool restoration projects, these efforts continue to stem the tide of wetland loss. The map on this page shows wetland restoration and improvement projects.

Many details about project are available through the California [EcoAtlas](#). EcoAtlas files may include permit details, contact information, habitat plans, and monitoring reports.

The map provided here is incomplete. Hundreds of restoration projects statewide have been accomplished by individuals, local watershed groups, conservation districts, agencies, and multi-agency work groups. We are working to update and improve this map.

# Coming Soon: California Estuaries Portal

## 💧 Estuary Monitoring Workgroup



- 💧 Initial focus is San Francisco Bay-Delta Estuary
  - 💧 Educational – What? Where? Food web relationships?
  - 💧 Estuary Health
    - 💧 Condition of major biological resources
    - 💧 Drivers of biological resource patterns
    - 💧 Detailed data – physical, hydrologic, chemical, meteorological

# Planned: Additional Portals

- 💧 Is our water safe to drink?
  - 💧 Department of Public Health lead
  - 💧 Telling entire story of water quality, delivery, treatment from the source to the tap – telling each agency's role
- 💧 Are our ocean and coastal ecosystems healthy?
  - 💧 Ocean Science Trust and Ocean Protection Council committed to developing path forward
  - 💧 Have proposed developing technology and process roadmap to workgroup and portal
    - 💧 Through their Agency Science Needs Assessment effort
    - 💧 Foundation funding being pursued

# Theme-Specific Workgroups and Portals

WATER BODY TYPES	T H E M E S			
	Is Our Water Safe to Drink?	Is It Safe to Swim in Our Waters?	Is It Safe to Eat Fish and Shellfish from Our Waters?	Are Our Aquatic Ecosystems Healthy?
Streams & Rivers	Safe Drinking Water Workgroup	Safe to Swim and Beach Water Quality Workgroups	SWAMP Bioaccumulation Oversight Group	SWAMP Healthy Streams Partnership
Lakes				
Estuaries				Estuary Monitoring Workgroup
Ocean Waters	N/A	N/A		Ocean Ecosystem Health Workgroup
Wetlands	N/A			Wetland Monitoring Workgroup
Groundwater	Safe Drinking Water Workgroup	N/A	N/A	N/A
Tap Water		N/A	N/A	N/A

# More Than Just Data on the Web

- 💧 Forming and maintaining lasting relationships
  - 💧 Through theme-specific workgroups
- 💧 Implementing a portal design that requires & motivates parties to solve issues related to
  - 💧 Monitoring and assessment coordination
  - 💧 Data integration
- 💧 Focus directly on management questions
- 💧 Provides structure that initiates dialogues
  - 💧 Induces broader-based thinking
  - 💧 Enables broader-based assessments



# Questions?



[www.MyWaterQuality.ca.gov](http://www.MyWaterQuality.ca.gov)